

Remarks:

This amendment is submitted in an earnest effort to advance this case to issue without delay.

In view of the new rejection, main claim 45 has been replaced with a new main claim 62 that is of somewhat different scope and that incorporates the limitations of now canceled claims 51, 53, and 58.

New claim 62 makes it clear that the instant invention is producing a strip of recycled PET. This strip is typically used for packaging and, even though it is made out of normally relatively weak recycled PET bottles and the like, it must be quite strong, while still somewhat stretchy.

Such a product is produced according to the invention as defined in new claim 62. The claim is specific in stating that:

1. The starting material is not crystallized or pretreated.
2. This starting material is plastified in an twin-screw extruder whose screw flights are only filled partially, namely 25% to 60%, while it is degassed.
3. A chain-lengthening substance is added to the PET in the extruder, thereby increasing its strength and elasticity.

4. Since the starting material - waste PET - is invariably of varying composition, the plastified stream is passed through a filter and its pressure is measured upstream and downstream so that the feed rate of the starting material and/or the rotation rate of the extruder screws can be varied to compensate for an extra-dirty or extra-clean starting material.
5. The filtered stream is then pumped through an extruder head to generate a strip.
6. This strip is then cooled with a fluid, twice stretched, and fixed to form the desired packaging web.

The claims stand rejected under §103 on a total of eleven references, of which at least five are used for any single claim. The amended claims avoid these combinations as follows.

US 2002/0100995 of Bandera relates to the extrusion of recycled and virgin PET. The material is plastified and degassed in a twin-screw extruder. There is nothing in Bandera to suggest making a strip usable as packaging web. In addition virtually none of steps c) through j) of new claim 62 are disclosed. This reference is very basic.

US 2,823,421 of Scarlett relates to a method of improving the physical properties of a polyester film, not PET. This process is for making films and foils usable as packing material. There is nothing relating to a tape or web, which is the product of this invention identified in the original application papers as a "band." In Scarlett the product is biaxially stretched, which would never be done to a web or tape. All that Scarlett shows is a stretching step, but not one comparable to the two-stage longitudinal stretching of step i) of the instant invention.

US 6,153,093 of Bentivoglio, US 4,849,113 of Hills, and the Rosato literature reference all do not relate to the manufacture of packaging material from recycled PET. Instead they relate generally to extrusion and filtering of polymers. They are nothing other than background for the instant invention.

US 6,409,949 of Tanaka relates to the extrusion of PE or PET, with degassing in an extruder. Here a chain lengthener is described, but beyond that features c) through j) of claim 1 are not shown or suggested.

US 5,281,676 of VanBuskirk and 5,807,932 of Pfaendner relate generally to modifying the molecular weight of polymers or polyesters. These references do not relate to the subject matter of new claim 62.

US 6,585,920 of Strobel describes the treatment of polymer foils. Here some cooling steps like step h) of claim 62 are disclosed, but otherwise this is just another part of a piecemeal rejection.

US 4,140,740 of DeSmedt relates generally to stretching polymer films, but deals mainly with biaxial stretching, not the simple double longitudinal stretching of this invention. PET is not mentioned.

US 6,589,463 of Vogt does actually deal with longitudinal stretching of a PET film. Otherwise nothing in claim 62 is disclosed.

Thus the complicated rejection represents a piecemeal reconstruction of the invention, which is in a very, very dense field. Admittedly the treatment and production of plastics is a complex field where often small changes can result in significant improvements in the final product. Here we are dealing with the recycling of an otherwise difficult-to-handle waste product, and the instant invention is a method of doing this in a manner that is not only continuous and highly efficient, but that produces a strong and stretchy tape from something that otherwise would constitute a disposal problem.

The instant invention as defined in new claim 62 is clearly allowable over the cited art under §103. Notice to that effect is earnestly solicited.

If only minor problems that could be corrected by means of a telephone conference stand in the way of allowance of this case, the examiner is invited to call the undersigned to make the necessary corrections.

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